

Application No.: 09/926,828  
Amendment Dated: October 14, 2003  
Reply to Office Action of: June 13, 2003

This listing of claims will replace all prior versions, and listings, of claims in the application:

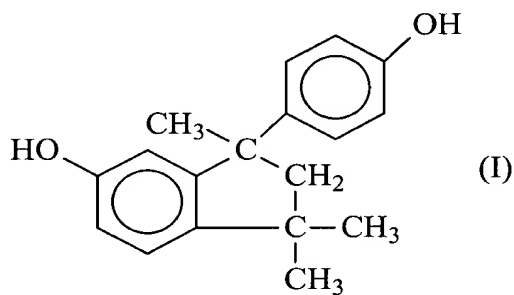
**LISTING OF CLAIMS**

1. (Withdrawn) A polycarbonate resin for an optical disk substrate, said substrate comprising from 100 to 500 ppm of a releasing agent,  
  
wherein said resin has a viscosity average molecular weight of from 10,000 to 17,000, an iron content of 0.2 ppm or less and a free total phenol content of 80 ppm or less.
2. (Withdrawn) The polycarbonate resin for an optical disk substrate described in claim 1, wherein said resin has an acetone soluble content of 12% by mass or less.
3. (Withdrawn) The polycarbonate resin for an optical disk substrate described in claim 1, wherein said resin comprises from 150 to 350 ppm of a releasing agent.
4. (Withdrawn) The polycarbonate resin for an optical disk substrate described in claim 1, wherein the releasing agent is a polyhydric alcohol fatty acid ester.
5. (Withdrawn) An optical disk substrate comprising the polycarbonate resin for an optical disk substrate claimed in claim 1.

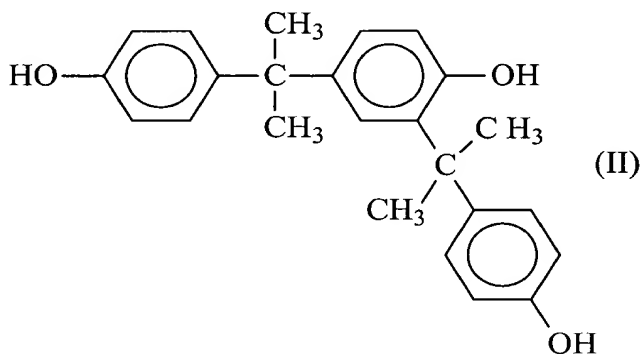
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6. (Withdrawn) A polycarbonate resin for an optical disk substrate, said substrate comprising 100 to 500 ppm of a releasing agent,

wherein said resin is obtained by polymerizing 2,2-(4-hydroxyphenyl)propane having a content of 2-(2-hydroxyphenyl)-2-(4-hydroxyphenyl)propane of 1,000 ppm or less, a content of a cyclic dimer of p-isopropenylphenol represented by the following formula (I) of 150 ppm or less:



and a content of a trisphenol compound represented by the following formula (II) of 150 ppm or less:



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wherein said resin has a viscosity average molecular weight of from 10,000 to 17,000 and a fraction of hydroxyl end groups of less than 7% by mole.

7. (Withdrawn) The polycarbonate resin for an optical disk substrate as described in claim 6, wherein said resin has a free total phenol content of 80 ppm or less.

8. (Withdrawn) The polycarbonate resin for an optical disk substrate described in claim 6, wherein said resin comprises from 150 to 350 ppm of a releasing agent.

9. (Withdrawn) The polycarbonate resin for an optical disk substrate described in claim 6, wherein the releasing agent is a polyhydric alcohol fatty acid ester.

10. (Withdrawn) An optical disk substrate comprising the polycarbonate resin for an optical disk substrate described in claim 6.

11. (Currently Amended) A polycarbonate resin composition ~~for an optical disk substrate, said substrate~~ comprising:

a polycarbonate resin; and

100 to 500 ppm at of a releasing agent,

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wherein said polycarbonate resin composition satisfies the following conditions:

- (1) a viscosity average molecular weight is from 10,000 to 17,000,
- (2) an iron content is 0.2 ppm or less;
- (3) when an intensity of a chemical shift  $\delta$  of from 7.0 to 7.5 ppm based on a phenyl ring in a spectrum measured with  $^1\text{H}$ -NMR is 1,000, a plurality of signal intensities at  $\delta$  of from 1.02 to 1.08 and from 6.69 to 6.73 are 0.01 or less;

wherein said polycarbonate resin is obtained from a dihydric phenol which has been purified by contacting with an ion exchange resin.

12. (Currently Amended) The polycarbonate resin composition ~~for an optical disk substrate~~ as described in claim 11, ~~wherein said resin~~ which comprises from 150 to 350 ppm of a releasing agent.

13. (Currently Amended) The polycarbonate resin composition ~~for an optical disk substrate~~ described in claim 11, wherein the releasing agent is a polyhydric alcohol fatty acid ester.

14. (Currently Amended) The polycarbonate resin composition ~~for an optical disk substrate~~ described in claim 13, wherein the polyhydric alcohol fatty acid ester is a fatty acid monoester of glycerin.

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15. (Currently Amended) An optical disk substrate comprising the polycarbonate resin composition ~~for an optical disk substrate~~ described in claim 11.

16. (Withdrawn) A polycarbonate resin for an optical disk substrate, said substrate comprising from 100 to 500 ppm of a releasing agent,

wherein said resin has a viscosity average molecular weight of from 10,000 to 17,000, an iron content of 0.2 ppm or less and a fraction of hydroxyl end groups of less than 7% by mole.

17. (Withdrawn) The polycarbonate resin for an optical disk substrate as described in claim 16, wherein said resin comprises from 150 to 350 ppm of a releasing agent.

18. (Withdrawn) The polycarbonate resin for an optical disk substrate described in claim 16, wherein the releasing agent is a polyhydric alcohol fatty acid ester.

19. (Withdrawn) The polycarbonate resin for an optical disk substrate described in claim 18, wherein the polyhydric alcohol fatty acid ester is a fatty acid monoester of glycerin.

20. (Withdrawn) An optical disk substrate comprising the polycarbonate resin for an optical disk substrate described in claim 16.

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21. (New) The polycarbonate resin composition as described in claim 11, further comprising:

20 to 100 ppm of a phosphorous antioxidant.

22. (New) The polycarbonate resin composition as described in claim 11, wherein said dihydric phenol used for obtaining the polycarbonate resin is bisphenol A.

23. (New) The polycarbonate resin composition as described in claim 11, wherein said ion exchange resin is an acidic ion exchange resin.

24. (New) The polycarbonate resin composition as described in claim 11, wherein said ion exchange resin is a sulfonic acid cation exchange resin.

25. (New) The polycarbonate resin composition as described in claim 11, wherein said dihydric phenol used for obtaining the polycarbonate resin is bisphenol A; and wherein said ion exchange resin is a sulfonic acid cation exchange resin.

26. (New) The optical disk substrate as described in claim 15, which comprises from 150 to 350 ppm of a releasing agent.

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27. (New) The optical disk substrate as described in claim 15, wherein the releasing agent is a polyhydric alcohol fatty acid ester.

28. (New) The optical disk substrate as described in claim 27, wherein the polyhydric alcohol fatty acid ester is a fatty acid monoester of glycerin.

29. (New) The optical disk substrate as described in claim 15, further comprising:  
20 to 100 ppm of a phosphorous antioxidant.

30. (New) The optical disk substrate as described in claim 15, wherein said dihydric phenol used for obtaining the polycarbonate resin is bisphenol A.

31. (New) The optical disk substrate as described in claim 15, wherein said ion exchange resin is an acidic ion exchange resin.

32. (New) The optical disk substrate as described in claim 15, wherein said ion exchange resin is a sulfonic acid cation exchange resin.

33. (New) The optical disk substrate as described in claim 15, wherein said dihydric phenol used for obtaining the polycarbonate resin is bisphenol A; and

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wherein said ion exchange resin is a sulfonic acid cation exchange resin.



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**BASIS FOR THE AMENDMENT**

Claim 11 has been amended as supported at page 33 to page 34, line 4 and by Example III-1.

New Claims 21-33 have been added.

New Claim 21 is supported at page 33, 1<sup>st</sup> full paragraph.

New Claim 22 is supported at page 33, line 4 from the bottom to page 34, line 4.

New Claim 23 is supported at page 34, lines 3 and 4.

New Claim 24 is supported at page 36, lines 11 and 12.

New Claim 25 is supported at page 33, line 4 from the bottom to page 34, line 4 and at page 36, lines 11 and 12.

New Claims 26-28 are supported by Claims 12-14 as originally filed.

New Claim 29 is supported at page 33, 1<sup>st</sup> full paragraph.

New Claim 30 is supported at page 33, line 4 from the bottom to page 34, line 4.

New Claim 31 is supported at page 34, lines 3 and 4.

New Claim 32 is supported at page 36, lines 11 and 12.

New Claim 33 is supported at page 33, line 4 from the bottom to page 34, line 4 and at page 36, lines 11 and 12.

No new matter is believed to have been added by entry of this amendment. Entry and favorable reconsideration are respectfully requested.

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Upon entry of this amendment Claims 1-33 will now be active in this application.  
Claims 1-10 and 16-20 stand withdrawn from consideration as being drawn to non-elected  
subject matter.

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### **INTERVIEW SUMMARY**

Applicants wish to thank Examiner Buttner for his helpful and courteous discussion with Applicants' Representative on October 1, 2003. During this discussion it was noted that the Examiner indicated that he would consider Claim 11 more favorably if Applicants include the limitation that an ion exchange resin is used during the purification process of the dihydric phenol that is used for the synthesis of the polycarbonate resin.

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### **REMARKS**

Applicants respectfully request reconsideration of the application, as amended, in view of the following remarks.

The present invention as set forth in **amended Claim 11** relates to a polycarbonate resin composition, comprising:

a polycarbonate resin; and

**100 to 500 ppm of a releasing agent,**

wherein said polycarbonate resin composition satisfies the following conditions:

(1) a viscosity average molecular weight is from 10,000 to 17,000,

(2) an iron content is 0.2 ppm or less;

(3) **when an intensity of a chemical shift  $\delta$  of from 7.0 to 7.5 ppm based on a phenyl ring in a spectrum measured with  $^1\text{H}$ -NMR is 1,000, a plurality of signal intensities at  $\delta$  of from 1.02 to 1.08 and from 6.69 to 6.73 are 0.01 or less;**

**wherein said polycarbonate resin is obtained from a dihydric phenol which has been purified by contacting with an ion exchange resin.**

Sakoda et al and JP2000-001608 fail to disclose or suggest the polycarbonate having the claimed  $^1\text{H}$ -NMR data. JP2000-22989 is not available as prior art against the present invention.

JP2000-22989 was published on August 22, 2000. However, the present application is a 371 application having an effective U.S. filing date of April 26, 2001, and claiming

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priority of Japanese applications JP2000-127336, JP2000-157802, JP2000-234047, and JP2000-234048, filed April 27, 2000, May 29, 2000, August 2, 2000 and August 2, 2000, respectively. Accordingly, the publication date of JP2000-22989 (August 22, 2000) is after the filing date of the Japanese priority applications of the present invention. Thus, JP2000-22989 is not available as prior art against the present invention. Applicants hereby submit a Certified English Translations of the Japanese priority documents JP2000-127336, JP2000-157802, JP2000-234047, and JP2000-234048, thereby perfecting their claim to priority.

Therefore, the rejection of Claims 11-15 under 35 U.S.C. §103(a) as being unpatentable over Sakoda et al or JP2000-001608 in view of JP2000-229899 is believed to be unsustainable and withdrawal of this rejection is respectfully requested.

In addition, the rejection of Claims 11-15 under 35 U.S.C. §103(a) as being unpatentable over Sakoda et al or JP2000-001608 in view of Meurer et al is respectfully traversed.

Sakoda et al and JP2000-001608 fail to disclose or suggest the polycarbonate having the claimed <sup>1</sup>H-NMR data.

Even though Meurer et al use BPA (bisphenol A) having a degree of purity of greater than 99.95wt.% (Meurer et al, col. 1, line 35), Meurer et al fail to purify the BPA in the presence of an ion exchange resin as presently claimed in Claim 11. Thus, the claimed <sup>1</sup>H-NMR data cannot be obtained.

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However, in the present invention, it is important to satisfy the claimed  $^1\text{H-NMR}$  data to obtain an optical disk substrate imparted with a superior performance, even if a releasing agent is used in a low amount of 100 to 500 ppm. Namely, the  $^1\text{H-NMR}$  data derived from certain impurities have a great influence upon the superior performance of the optical disk substrate. In order to obtain the claimed  $^1\text{H-NMR}$  data, the dihydric phenol (such as BPA) is purified as claimed in Claim 11. See Example III-1 at page 35, last two lines to page 36. A sulfonic acid cation exchange resin is used during the purification of BPA (page 36, lines 11 and 12) and the claimed  $^1\text{H-NMR}$  data are achieved (page 38, last paragraph).

On the other hand, in Comparative Example III-1, at page 39 of the specification, an acidic ion-exchange resin was not used for the purification and the claimed  $^1\text{H-NMR}$  data are not achieved (page 40, last paragraph). Specifically, a signal appeared at  $\delta = 1.04$  ppm with an intensity of **0.23** and signals appeared at  $\delta = 6.69$  and  $6.71$  ppm with an intensity of **0.9 and 0.32**, respectively. However, Claim 11 requires a plurality of signal intensities at  $\delta$  of from 1.02 to 1.08 and from 6.69 to 6.73 of **0.01 or less**. Thus, the present invention cannot be obtained without the use of the ion exchange resin during the purification of the dihydric phenol. Accordingly, even a combination of Sakoda et al or JP2000-001608 with Meurer et al does not result in the claimed invention.

Therefore, the rejection of Claims 11-15 under 35 U.S.C. §103(a) as being unpatentable over Sakoda et al or JP2000-001608 in view of Meurer et al is believed to be

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unsustainable as the present invention is neither anticipated nor obvious and withdrawal of this rejection is respectfully requested.

Applicants respectfully request that the Examiner acknowledge that the references cited in the **Information Disclosure Statement**, filed in the above-identified application on **August 8, 2003**, have been considered. For the Examiner's convenience a copy of Form PTO 1449 as filed on **August 8, 2003**, is attached herewith.

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This application presents allowable subject matter, and the Examiner is kindly requested to pass it to issue. Should the Examiner have any questions regarding the claims or otherwise wish to discuss this case, he is kindly invited to contact Applicants' below-signed representative, who would be happy to provide any assistance deemed necessary in speeding this application to allowance.

Respectfully submitted,

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